

Notes on the Range Extension
of the Boring Clam *Penitella conradi* VALENCIENNES
and its Occurrence in the Shell of the California Mussel

BY

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(Plate 42)

THE STUDY REPORTED ON herein was conducted at the Haystack Rock area, Cannon Beach, Clatsop County, Oregon, Latitude 45° 53' 04" N, Longitude 123° 58' W. Investigations were carried on seasonally throughout 1964 as a part of the studies for a master's thesis at the University of Puget Sound, Tacoma, Washington, and again in the summer of 1966, while the writer was in residence at the Oregon State University Marine Science Center, Newport, Oregon.

The range of *Penitella conradi* VALENCIENNES, 1846 was previously reported to be from Bahía San Bartolomé, Baja California, Mexico, to Gualala, Mendocino County, California (TURNER, 1955). This species has not previously been reported in Oregon, and this report represents a considerable extension of its northern range limit. TURNER reported finding *P. conradi* in the shells of various mollusks, including *Mytilus californianus* CONRAD, 1837, in California. This species is very commonly found infesting species of *Haliotis* (abalones) and has been commonly referred to as the "*Haliotis* borer."

The mussel beds at Cannon Beach attain a maximum vertical width of approximately 7 feet on the rock faces, and a check of several hundred *Mytilus* revealed that *Penitella* is restricted to the lowest 2 feet of the beds. A thorough examination of 113 mussels showed that the percentage of infestation was approximately 20%. The number of borers per host ranged from 1 to 11, with an average of 3.8.

Penitella conradi invades the mussel when quite young and grows considerably as it bores slowly into the valve, thus creating a conically-shaped burrow. The entry holes range in size from less than 1 mm to 2 mm in diameter and are often difficult to detect, especially if the mussel valves are heavily fouled with such organisms as barnacles, tubicolous polychaetes, etc; therefore, a fast and reliable method of determining whether or not the borer is present is to open the host, remove the soft tissues, and examine the inner surface of the valves. The presence of the invader is evidenced by patches of black, leathery conchylin, laid down in response to the boring activities (Plate 42, Figure 1). In many cases the conchylar patch is surrounded by a thickened, warped area of the valve. Occasionally, where there is multiple infestation in a limited area of the valve, warping may be so severe as to nearly occlude the mantle cavity; however, such mussels appear otherwise normal.

Removal of the borer from its burrow intact may be accomplished with the careful aid of a hammer and chisel by fracturing the host's valve immediately adjacent to the burrow; this will usually lay open the burrow without harming the borer, which can then be removed gently with forceps. In one instance this procedure fortunately revealed both an immature and an adult stage of *Penitella* (Plate 42, Figure 2), the former being larger than the latter in this case. The immature stages of *P. conradi* and other pholads are characterized by gaping valves and a large,

muscular foot, both vital in the boring process. Upon attaining the adult stages, the animal ceases boring, becomes sessile, and the area between the valves becomes closed off by a thin, calcareous layer known as a callum. This striking change in morphology during the life cycle of the animal has led to considerable confusion in the taxonomy of pholads in the past, e. g., the immature, boring stage of *P. conradi* was previously described and well known as *Navaea subglobosa* GRAY, 1851.

LITERATURE CITED

TURNER, RUTH DIXON

1955. The family Pholadidae in the Western Atlantic and Eastern Pacific. Part II - Martesiinae, Jouannetiinae and Xylophaginae. *Johnsonia* 3 (34): 65 - 160; pls. 35 - 93.

